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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,887	08/14/2006	Sang Hyun Lee	2913714300	8072

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EXAMINER	
KWON, ASHLEY M	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
07/16/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,887	LEE ET AL.	
	Examiner	Art Unit	
	ASHLEY KWON	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *8-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/8/07, 1/25/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-7 in the reply filed on May 13, 2009 is acknowledged.

Claims 8-16 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Groups II and III, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on May 13, 2009.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 3, 5, and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the "active layer" and "gas diffusion layer" recited in the claims refers to the active layer and gas diffusion layer of the anode, cathode, or both. Applicant is asked to clarify.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 rejected under 35 U.S.C. 102(b) as being anticipated by Banerjee et al. (US Pat. No. 5,415,888) (hereinafter "Banerjee").

Regarding claim 1, Banerjee discloses a membrane-electrode assembly comprising: electrodes consisting of a anode comprising a gas diffusion layer (gas permeable porous layer, see col. 8, lines 27-78) and a catalyst material-containing active layer, and an cathode comprising a diffusion layer and a catalyst material-containing active layer; and an electrolyte membrane interposed between the anode and the cathode and comprising a catalyst material-containing active layer at one or both sides (electrode ink, see col. 4, lines 36-40), the electrodes being hot-pressed to the electrolyte membrane (decal process, see col. 8, lines 37-38 and col. 2, lines 62-66), wherein the viscosity of the active layer in coating the active layer on the gas diffusion layer is in a range of 100 to 10,000 cPs (1-100 Poises) (see col. 6, lines 7-11). Banerjee discloses that the catalytic ink is added to the surface of the electrolyte membrane (see col. 6, lines 48-49). Once the anode and cathode layers (gas permeable porous layers) are hot pressed onto the membrane comprising the catalytic ink, the catalytic ink is also a part of the anode and cathode as well. Therefore, for the purposes of this rejection, the half of the catalytic ink in contact with the anode or

cathode will be considered as the catalyst material-containing active layer of the anode and cathode, while the other half of the catalytic ink in contact with the electrolyte membrane will be considered as the catalyst material-containing active layer of the electrolyte membrane. Furthermore the limitation "the electrodes being hot-pressed to the electrolyte membrane wherein the viscosity of the active layer in coating the active layer on the gas diffusion layer is in a range of 100 to 10,000 cPs" is considered product by process and is not given patentable weight.

Regarding claim 3, Banerjee discloses the membrane-electrode assembly of Claim 1, wherein the catalyst particles forming the active layer of electrode are coated with an electrolyte. Banerjee discloses that the electrode layers are formed on the membrane after the catalytic ink on the electrolyte membrane as dried (see col. 9, liens 29-30).

Regarding claim 4, Banerjee discloses the membrane-electrode assembly of Claim 1, wherein the catalyst coated on a anode side-surface of the electrolyte membrane is the same as the catalyst of the active layer in the anode, and the catalyst coated on an cathode side-surface of the electrolyte membrane is the same as the catalyst of the active layer in the cathode. As explained above for claim 1, the catalytic ink applied to the electrolyte membrane makes up the active layers of the electrolyte membrane, anode, and cathode, therefore the catalyst would be the same for all three components.

Claims 5 and 6 is/are considered product-by-process claims. The cited prior art teaches all of the positively recited structure of the claimed apparatus or product. The

determination of patentability is based upon the apparatus structure itself. The patentability of a product or apparatus does not depend on its method of production or formation. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (see MPEP § 2113). Therefore, the limitation that the active layer on the gas diffusion layer is coated on the gas diffusion layer by a curtain coating process, and the active layer on the electrolyte membrane is coated by a spray coating process are not given patentable weight because the prior art discloses the final product of a membrane electrode assembly comprising a gas diffusion layer and electrolyte membrane with an active layer.

Regarding claim 7, Banerjee discloses the membrane-electrode assembly of Claim 1, wherein the amount of the active layer formed on the electrolyte membrane is 1-100% by weight based on the weight of the active layer formed on the gas diffusion layer. As explained above in claim 1, the half of the catalytic ink in contact with the anode or cathode will be considered as the catalyst material-containing active layer of the anode and cathode, while the other half of the catalytic ink in contact with the electrolyte membrane will be considered as the catalyst material-containing active layer of the electrolyte membrane. Therefore the amount of the active layer formed on the electrolyte membrane would be 100% by weight based on the weight of the active layer formed on the gas diffusion layer since the catalytic ink is split in half.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Banerjee. Regarding claim 2, Banerjee fails to explicitly disclose the membrane-electrode assembly of Claim 1, wherein the viscosity of the active layer (catalytic ink) in coating the active layer on the gas diffusion layer is in a range of 1,000 to 10,000 cPs (10-100 poises). Banerjee does disclose that the catalytic ink has a viscosity in a range of 1 to 100 poises, especially about 100 poises, and that the viscosity can be controlled by (i) selecting particle sizes, (ii) composition of the catalytically active particles and binder, (iii) a content of water as the medium or (iv) by incorporating a viscosity regulating agent (see col. 6, lines 7-14). The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see

MPEP § 2144.05, II.). Furthermore, It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Therefore it would have been obvious to one of ordinary skill in the art to optimize the range taught by Banerjee to a viscosity between 10 to 100 poises.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASHLEY KWON whose telephone number is (571)270-7865. The examiner can normally be reached on Monday to Thursday 7:30 - 6 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AK

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795